



HIGH-PRESSURE DIRECTIONAL DRILLING

Fisheries and Oceans Canada
Ontario Operational Statement

Version 3.0

For the purpose of this Operational Statement, the term High-Pressure Directional Drilling (HPDD) means trenchless methods of crossing a watercourse using pressurized mud systems. HPDD is used to install cables and pipelines for gas, telecommunications, fibre optics, power, sewer, oil and water lines underneath watercourses and roads. This method is preferable to open-cut and isolated crossings since the cable or pipeline is drilled underneath the watercourse with very little disturbance to the bed or banks. HPDD involves drilling a pilot bore hole underneath the watercourse towards a surface target, back-reaming the bore hole to the drill rig while pulling the pipe along through the hole. This process typically uses the freshwater gel mud system composed of a mixture of clean, freshwater as the base, bentonite (clay-based drilling lubricant) as the viscosifier and synthetic polymers.

The general order of preference for carrying out a cable or pipeline stream crossing in order to protect fish and fish habitat is: a) a punch or bore crossing (see *Punch & Bore Crossings* Operational Statement), b) HPDD crossing, c) dry open-cut crossing, and d) isolated open-cut crossing (see *Isolated or Dry Open-cut Stream Crossings* Operational Statement). This order must be balanced with practical considerations at the site.

One of the risks associated with HPDD is the escape of drilling mud into the environment as a result of a spill, tunnel collapse or the rupture of mud to the surface, commonly known as “frac-out”. A frac-out is caused when excessive drilling pressure results in drilling mud propagating toward the surface. The risk of a frac-out can be reduced through proper geotechnical assessment practices and drill planning and execution. The extent of a frac-out can be limited by careful monitoring and having appropriate equipment and response plans ready in the event that one occurs. HPDD can also result in excessive disturbance of riparian vegetation and sedimentation and erosion due to operation of equipment on the shoreline or fording to access the opposite bank.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your

high-pressure directional drill project without a DFO review when you meet the following conditions:

- the crossing technique will not damage the stream bed and thereby negatively impact fish or fish habitat,
- the crossing is not a wet open-cut crossing,
- you have an emergency frac-out response plan and a contingency crossing plan in place that outline the protocol to monitor, contain and clean-up a potential frac-out and an alternative method for carrying out the crossing, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when High-Pressure Directional Drilling* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when High-Pressure Directional Drilling

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Design the drill path to an appropriate depth below the watercourse to minimize the risk of frac-out and to a depth

to prevent the line from becoming exposed due to natural scouring of the stream bed. The drill entry and exit points are far enough from the banks of the watercourse to have minimal impact on these areas.

3. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the road or utility right-of-way.
4. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing* Operational Statement is also available.
 - 4.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
 - 4.2. Grading of the stream banks for the approaches should not occur.
 - 4.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 4.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
 - 4.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
5. Operate machinery on land above the ordinary high water mark (see definition below) and in a manner that minimizes disturbance to the banks of the watercourse.
 - 5.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 5.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 5.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
 - 5.4. Restore banks to original condition if any disturbance occurs.
6. Construct a dugout/settling basin at the drilling exit site to contain drilling mud to prevent sediment and other deleterious substances from entering the watercourse. If this cannot be achieved, use silt fences or other effective sediment and erosion control measures to prevent drilling mud from entering the watercourse. Inspect these measures regularly during the course of construction and make all necessary repairs if any damage occurs.
 - 6.1. Dispose of excess drilling mud, cuttings and other waste materials at an adequately sized disposal

facility located away from the water to prevent it from entering the watercourse.

7. Monitor the watercourse to observe signs of surface migration (frac-out) of drilling mud during all phases of construction.

Emergency Frac-out Response and Contingency Planning

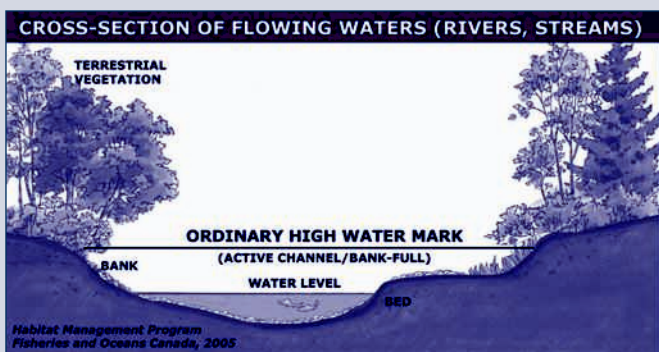
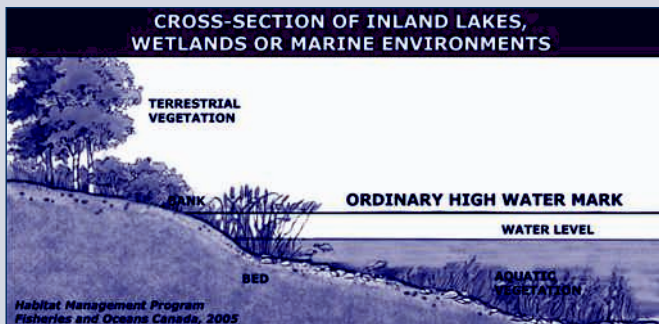
8. Keep all material and equipment needed to contain and clean up drilling mud releases on site and readily accessible in the event of a frac-out.
9. Implement the frac-out response plan that includes measures to stop work, contain the drilling mud and prevent its further migration into the watercourse and notify all applicable authorities, including the closest DFO office in the area (see Ontario DFO office list). Prioritize clean up activities relative to the risk of potential harm and dispose of the drilling mud in a manner that prevents re-entry into the watercourse.
10. Ensure clean up measures do not result in greater damage to the banks and watercourse than from leaving the drilling mud in place.
11. Implement the contingency crossing plan including measures to either re-drill at a more appropriate location or to isolate the watercourse to complete the crossing at the current location. See *Isolated or Dry Open-cut Stream Crossings* Operational Statement for carrying out an isolated trenched crossing.
12. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with preferably native grass or shrubs.
13. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 13.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial

vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

For the Great Lakes this refers to the 80th percentile elevation above chart datum as described in DFO's *Fish Habitat and Determining the High Water Mark on Lakes*.



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http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp

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NOTIFICATION FORM

Fisheries and Oceans Canada
Ontario Operational Statement

Version 3.1

PROPONENT INFORMATION

NAME: STREET ADDRESS:
CITY/TOWN: PROVINCE/TERRITORY: POSTAL CODE:
TEL. NO. (RESIDENCE): TEL. NO. (WORK):
FAX NO: EMAIL ADDRESS:

CONTRACTOR INFORMATION (provide this information if a Contractor is working on behalf of the Proponent)

NAME: STREET ADDRESS:
CITY/TOWN: PROVINCE/TERRITORY: POSTAL CODE:
TEL. NO. (RESIDENCE): TEL. NO. (WORK):
FAX NO: EMAIL ADDRESS:

PROJECT INFORMATION

Select Operational Statements that are being used (check all applicable boxes):

- | | | |
|---|---|---|
| <input type="checkbox"/> Beach Creation for Residential Use | <input type="checkbox"/> Ice Bridges and Snow Fills | <input type="checkbox"/> Public Beach Maintenance |
| <input type="checkbox"/> Beaver Dam Removal | <input type="checkbox"/> Isolated Pond Construction | <input type="checkbox"/> Punch & Bore Crossings |
| <input type="checkbox"/> Bridge Maintenance | <input type="checkbox"/> Isolated or Dry Open-cut Stream Crossings | <input type="checkbox"/> Routine Maintenance Dredging |
| <input type="checkbox"/> Clear-Span Bridges | <input type="checkbox"/> Maintenance of Riparian Vegetation in Existing Rights-of-Way | <input type="checkbox"/> Submerged Log Salvage |
| <input type="checkbox"/> Culvert Maintenance | <input type="checkbox"/> Mineral Exploration Activities | <input type="checkbox"/> Temporary Stream Crossing |
| <input type="checkbox"/> Dock and Boathouse Construction | <input type="checkbox"/> Moorings | <input type="checkbox"/> Underwater Cables |
| <input type="checkbox"/> High-Pressure Directional Drilling | <input type="checkbox"/> Overhead Line Construction | |

Select the type of water body or watercourse at or near your project:

- | | | |
|---|---|----------------------------------|
| <input type="checkbox"/> River, Stream, Creek | <input type="checkbox"/> Marine (Ocean or Sea) | <input type="checkbox"/> Estuary |
| <input type="checkbox"/> Lake (8 hectares or greater) | <input type="checkbox"/> Pond or wetland (pond is less than 8 hectares) | |

PROJECT LOCATION (S) (fill out this section if the project location is different from Proponent Information; append multiple project locations on an additional sheet if necessary)

Name of water body or watercourse	Coordinates of the Project (UTM co-ordinate or Degrees, Minutes, Seconds), if available Easting: Northing: Latitude: Longitude:
Legal Description (Plan, Block, Lot, Concession, Township)	Directions to Access the Project Site (i.e., Route or highway number, etc.)
Proposed Start Date (YYYY/MM/DD):	Proposed Completion Date (YYYY/MM/DD):

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending in, by mail or by fax, this notification form to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to the Operational Statement.

I, _____ (print name) certify that the information given on this form is, to the best of my knowledge, correct and complete.

Signature _____ Date _____

Note: If you cannot meet all of the conditions and cannot incorporate all of the measures in the Operational Statement then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list), or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain more information on the possible options you should consider to avoid contravention of the *Fisheries Act*. For activities carried out under the *Crown Forest Sustainability Act*, the requirements of the applicable Operational Statements are addressed through an existing agreement and the Ontario Ministry of Natural Resources is the first point of contact.

Information about the above-noted proposed work or undertaking is collected by DFO under the authority of the *Fisheries Act* for the purpose of administering the fish habitat protection provisions of the *Fisheries Act*. Personal information will be protected under the provisions of the *Privacy Act* and will be stored in the Personal Information Bank DFO-SCI-605. Under the *Privacy Act*, individuals have a right to, and on request shall be given access to, any personal information about them contained in a personal information bank. Instructions for obtaining personal information are contained in the Government of Canada's Info Source publications available at www.infosource.gc.ca or in Government of Canada offices. Information other than "personal" information may be accessible or protected as required by the provisions of the *Access to Information Act*.

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http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp



ISOLATED OR DRY OPEN-CUT STREAM CROSSINGS

Fisheries and Oceans Canada
Ontario Operational Statement

Version 1.0

For the purpose of this Operational Statement, the term “Isolated Crossing” means a temporary stream crossing technique that allows work (e.g., trenched pipeline or cable installation) to be carried out “in-the-dry” while diverting the natural flow around the site during construction. These types of open trenched crossings are isolated using flume or dam and pump techniques (see *Pipeline Associated Watercrossings*, 2005 at http://www.capp.ca/default.asp?V_DOC_ID=763&PubID=96717).

The term “Dry Open-cut Stream Crossing” means a temporary stream crossing work (e.g., trenched pipeline or cable installation) that is carried out during a period when the entire stream width is seasonally dry or is frozen to the bottom.

The risks to fish and fish habitat associated with isolated open cut stream crossings include the potential for direct damage to substrates, release of excessive sediments, loss of riparian habitat, stranding of fish in dewatered areas, impingement/entrainment of fish at pump intakes, and disruption of essential fish movement patterns. Similarly, dry open-cut stream crossings pose a risk to fish and fish habitat due to potential harmful alteration of substrates, loss of riparian habitat, and release of excessive sediment once stream flows resume.

The order of preference for carrying out a cable or pipeline stream crossing, in order to protect fish and fish habitat, is: a) punch or bore crossing (see *Punch & Bore Crossings* Operational Statement); b) high-pressure directional drill crossing (see *High-Pressure Directional Drilling* Operational Statement); c) dry open-cut crossing; and d) isolated open-cut crossing. This order must be balanced with practical considerations at the site.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your isolated or dry open-cut stream crossing project without a DFO review when you meet the following conditions:

- if working within the Thames River, Sydenham River, Ausable River, Grand River, or Maitland River, you have contacted your Conservation Authority or local DFO Office (see Ontario

DFO office list) to ensure that your project will not impact Schedule I mussel species at risk under the federal *Species at Risk Act* (SARA), before proceeding,

- for dry, open-cut crossings the watercourse is dry or frozen completely to the bottom at the site,
- for isolated crossings, the channel width of the watercourse at the crossing site is less than 5 meters from ordinary high water mark to ordinary high water mark (HWM) (see definition below),
- the isolated crossing does not involve the construction or use of an off-stream diversion channel, or the use of earthen dams,
- the isolated crossing ensures that all natural upstream flows are conveyed downstream during construction, with no change in quality or quantity,
- the site does not occur at a stream location involving known fish spawning habitat, particularly if it is dependent on groundwater upwelling,
- the use of explosives is not required to complete the crossing, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-cut Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with SARA (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-Cut Stream Crossing

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Locate crossings at straight sections of the stream, perpendicular to the banks, whenever possible. Avoid crossing on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.
3. Complete the crossing in a manner that minimizes the duration of instream work.
4. Construction should be avoided during unusually wet, rainy or winter thaw conditions.
5. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the utility right-of-way.
6. Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use. Operational Statements are also available for *Ice Bridges and Snow Fills*, *Clear-Span Bridges*, and *Temporary Stream Crossing*.
 - 6.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
 - 6.2. Grading of the stream banks for the approaches should not occur.
 - 6.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 6.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
 - 6.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
7. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.
 - 7.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
 - 7.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

- 7.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
- 7.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
8. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated Crossing

Temporary isolation is used to allow work “in-the-dry” while maintaining the natural downstream flow by installing dams up and downstream of the site and conveying all of the natural upstream flow into a flume, or pumping it around the isolated area. In addition to measures 1 to 10, the following measures should be carried out when conducting an isolated stream crossing:

11. Time isolated crossings to protect sensitive fish life stages by adhering to fisheries timing windows (see Measure 6.4).
12. Use dams made of non-earthen material, such as water-inflated portable dams, pea gravel bags, concrete blocks, steel or wood wall, clean rock, sheet pile or other appropriate designs, to separate the dewatered work site from flowing water.
 - 12.1. If granular material is used to build dams, use clean or washed material that is adequately sized (i.e., moderately sized rock and not sand or gravel) to withstand anticipated flows during the construction. If necessary, line the outside face of dams with heavy poly-plastic to make them impermeable to water. Material to build these dams should not be taken from below the HWM of any water body.
 - 12.2. Design dams to accommodate any expected high flows of the watercourse during the construction period.

13. Before dewatering, rescue any fish from within the isolated area and return them safely immediately downstream of the worksite.

13.1. You will require a permit from DFO to relocate any aquatic species that are listed as either endangered or threatened under SARA. Please contact your Conservation Authority or the DFO office in your area to determine if an aquatic species at risk is in the vicinity of your project and, if appropriate, use the DFO website at www.dfo-mpo.gc.ca/species-especies/permits/sarapermits_e.asp to apply for a permit.

14. Pump sediment laden dewatering discharge into a vegetated area or settling basin, and prevent sediment and other deleterious substances from entering any water body.

15. Remove accumulated sediment and excess spoil from the isolated area before removing dams.

16. Stabilize the **streambed** and restore the original channel shape, bottom gradient and substrate to pre-construction condition before removing dams.

17. Ensure **banks** are stabilized, restored to original shape, adequately protected from erosion and re-vegetated, preferably with native species.

18. If rock is used to stabilize banks, it should be clean, free of fine materials, and of sufficient size to resist displacement during peak flood events. The rock should be placed at the original stream bank grade to ensure there is no infilling or narrowing of the watercourse.

19. Gradually remove the downstream dam first, to equalize water levels inside and outside of the isolated area and to allow suspended sediments to settle.

20. During the final removal of dams, restore the original channel shape, bottom gradient and substrate at these locations.

21. Pumped Diversion

Pumped diversions are used to divert water around the isolated area to maintain natural downstream flows and prevent upstream ponding.

21.1. Ensure intakes are operated in a manner that prevents streambed disturbance and fish mortality. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO (e.g., *Freshwater Intake End-of-Pipe Fish Screen Guideline* (1995), available at www.dfo-mpo.gc.ca/Library/223669.pdf).

21.2. Ensure the pumping system is sized to accommodate any expected high flows of the watercourse during the construction period. Pumps should be monitored at all times, and back-up pumps should be readily available on-site in case of pump failure.

21.3. Protect pump discharge area(s) to prevent erosion and the release of suspended sediments downstream, and remove this material when the works have been completed.

Measures to Protect Fish and Fish Habitat when Carrying Out a Dry Open-Cut Stream Crossing

In addition to measures 1 to 10, the following measures should be carried out when conducting a dry open-cut stream crossing:

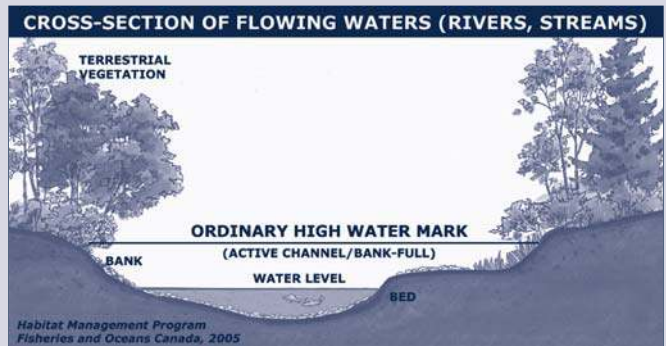
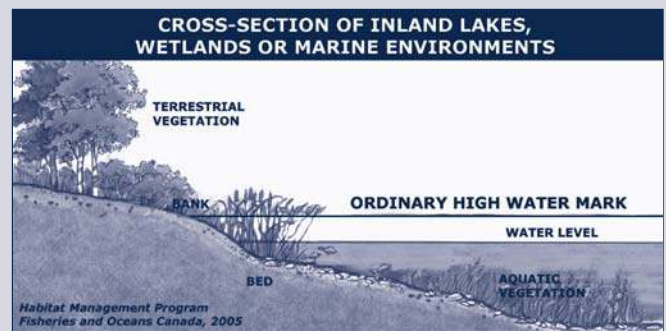
22. Stabilize the **streambed** and restore the original channel shape, bottom gradient and substrate to pre-construction condition.

23. Ensure **banks** are stabilized, restored to original shape, adequately protected from erosion and re-vegetated, preferably with native species.

Definition:

Ordinary high water mark (HWM) - The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the "active channel/bank-full level" which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

For the Great Lakes this refers to the 80th percentile elevation above chart datum as described in DFO's Fish Habitat and Determining the High Water Mark on Lakes.



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OVERHEAD LINE CONSTRUCTION

Fisheries and Oceans Canada
Ontario Operational Statement

Version 3.0

Overhead lines are constructed for electrical or telecommunication transmission across many watercourses that range in size from small streams and ponds to large rivers, lakes and reservoirs. This Operational Statement applies to selective removal of vegetation along the right-of-way to provide for installation and safe operation of overhead lines, and passage of equipment and materials across the water body.

Although fish habitat occurs throughout a water system, it is the riparian habitat that is most sensitive to overhead line construction. Riparian vegetation occurs adjacent to the watercourse and directly contributes to fish habitat by providing shade, cover, and spawning and food production areas. It is important to design and build your overhead line project to meet your needs while also protecting riparian areas. Potential impacts to fish and fish habitat include excessive loss of riparian vegetation, erosion and sedimentation resulting from bank disturbance and loss of plant root systems, rutting and compaction of stream substrate at crossing sites, and disruption of sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your overhead line project without a DFO review when you meet the following conditions:

- it does not require the construction or placement of any temporary or permanent structures (e.g. islands, poles, crib works, etc.) below the ordinary high water mark (HWM) (see definition below), and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case,

you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines

1. Installing overhead lines under frozen conditions is preferable in all situations. On wet terrains (e.g., bogs), lines should be installed under frozen conditions, where possible, or using aerial methods (i.e., helicopter).
2. Design and construct approaches so that they are perpendicular to the watercourse wherever possible to minimize loss or disturbance to riparian vegetation.
3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or overhead line structures.
 - 3.1. Wherever possible, locate all temporary or permanent structures, such as poles, sufficiently above the HWM to prevent erosion.
4. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to accommodate the overhead line. This removal

should be kept to a minimum and within the road or utility right-of-way.

5. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.

5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.

5.2. Grading of the stream banks for the approaches should not occur.

5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.

5.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).

5.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

6. Operate machinery on land and in a manner that minimizes disturbance to the banks of the watercourse.

6.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

6.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.

6.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

6.4. Restore banks to original condition if any disturbance occurs.

7. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.

7.1. Avoid work during wet, rainy conditions or use alternative techniques such as aerial methods (i.e., helicopter) to install overhead lines.

8. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.

9. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g.,

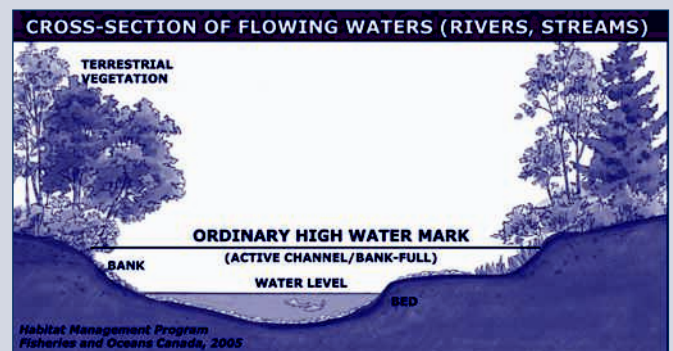
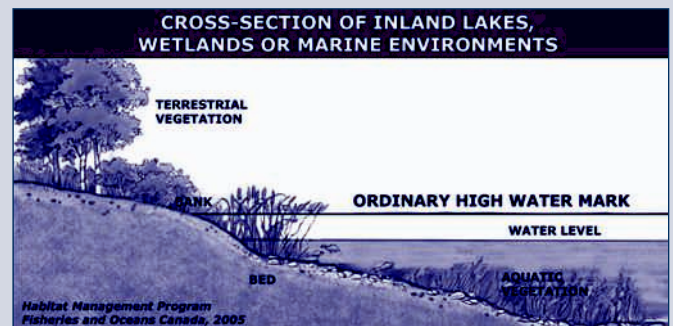
cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.

9.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

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PUNCH & BORE CROSSINGS

Fisheries and Oceans Canada
Ontario Operational Statement

Version 3.0

For the purpose of this Operational Statement, the term punch and bore refers to a trenchless crossing method which involves the excavation of a vertical bell hole or shallow depression on either side of the watercourse. Horizontal punching or boring between the two points, at an appropriate depth below the watercourse, completes the creation of a passage-way for the crossing. Punch and bore crossings allow cables and pipelines to be installed under watercourses without imparting any disturbance to the bed and banks. Punch and bore crossings differ from high-pressure directional drilled crossings, in that no pressurized mud systems are required, thereby avoiding the risk of sediment release due to frac-out.

Punch and bore crossings can negatively impact fish and fish habitat due to erosion and sedimentation from site disturbance and dewatering of bell holes or the collapse of the punch or bore hole under the stream. Disturbing riparian vegetation can reduce important shoreline cover, shade and food production areas. Machinery fording the stream can disturb bottom and bank substrates, disrupt sensitive fish life stages, and introduce deleterious substances if equipment is not properly maintained. Impacts can be reduced if an emergency response plan and clean-up materials are in place.

The general order of preference for carrying out a cable or pipeline stream crossing in order to protect fish and fish habitat is: a) a punch or bore crossing, b) high-pressure directional drill crossing (see *High-Pressure Directional Drilling* Operational Statement), c) dry open-cut crossing, and d) isolated open-cut crossing (see *Isolated or Dry Open-cut Stream Crossings* Operational Statement). This order must be balanced with practical considerations at the site.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to be incorporated into your project in order to avoid negative impacts to fish habitat. You may proceed with your punch or bore crossing project without a DFO review when you meet the following conditions:

- the crossing is not a wet open-cut crossing,

- the crossing technique will not damage the stream bed or bank and thereby negatively impact fish or fish habitat,
- the site does not occur at a stream location involving known fish spawning habitat, particularly if it is dependent on groundwater upwelling, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Conducting Punch and Bore Crossings*, listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Conducting Punch and Bore Crossings

1. A punch or bore crossing can be conducted at any time of the year provided there is not a high risk of failure and it does not require in-water activities such as machinery fording.
2. Design the punch or bore path for an appropriate depth below the watercourse to prevent the pipeline or cable from becoming exposed due to natural scouring of the stream bed.

3. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site and to excavate the bell holes. This removal is to be kept to a minimum and within the utility right-of-way.
4. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the water body. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
5. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.
 - 5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
 - 5.2. Grading of the stream banks for the approaches should not occur.
 - 5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 5.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
 - 5.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
6. Operate machinery on land above the ordinary high water mark (HWM) (see definition below) and in a manner that minimizes disturbance to the banks of the watercourse.
 - 6.1. Machinery is to arrive on-site in a clean condition and is to be maintained free of fluid leaks.
 - 6.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 6.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
7. Excavate bell holes beyond the HWM, far enough away from any watercourse to allow containment of any sediment or deleterious substances above the HWM.
 - 7.1. When dewatering bell holes, remove suspended solids by diverting water into a vegetated area or settling basin, and prevent sediment and other deleterious substances from entering the watercourse.

- 7.2. Stabilize any waste materials removed from the work site (including bell holes) to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
- 7.3. After suitably backfilling and packing the bell holes, vegetate any disturbed areas (see Measure 11).
8. Monitor the watercourse to observe signs of malfunction during all phases of the work.
9. For the duration of the work, keep on-site and readily accessible, all material and equipment needed to contain and clean-up releases of sediment-laden water and other deleterious substances.
10. Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance. This plan is to include measures to:
 - a) stop work, contain sediment-laden water and other deleterious substances and prevent their further migration into the watercourse;
 - b) notify all applicable authorities in the area, including the closest DFO office;
 - c) promptly clean-up and appropriately dispose of the sediment-laden water and deleterious substances; and
 - d) ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse.
11. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 11.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

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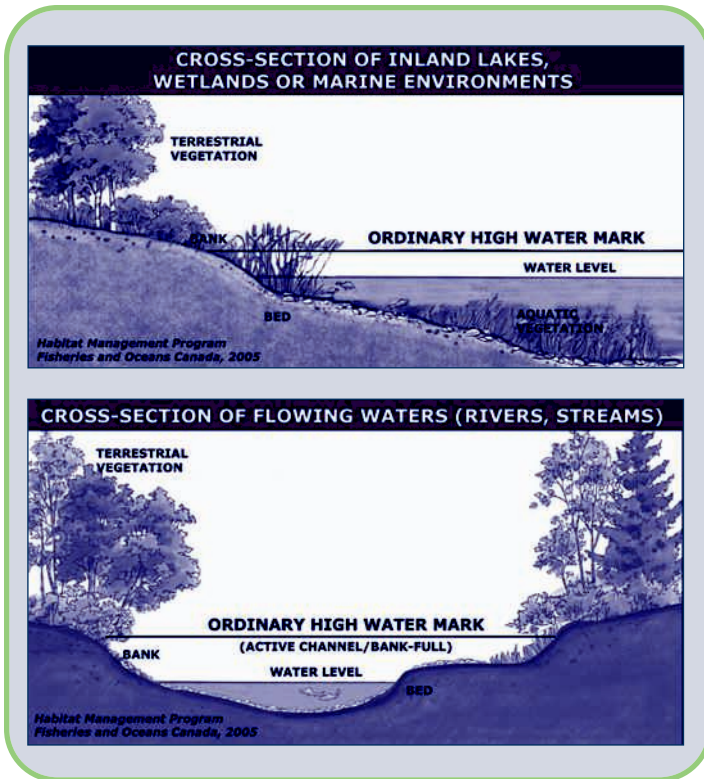
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TEMPORARY STREAM CROSSING

Fisheries and Oceans Canada
Ontario Operational Statement

Version 1.0

A temporary stream crossing consists of i) a one-time ford in flowing waters, ii) a seasonally dry streambed ford, or iii) a temporary bridge (e.g., Bailey bridge or log stringer bridge). Temporary stream crossings are employed for short term access across a watercourse by construction vehicles when an existing crossing is not available or practical to use. They are not intended for prolonged use (e.g., forest or mining haul roads). The use of temporary bridges or dry fording is preferred over fording in flowing waters due to the reduced risk of damaging the bed and banks of the watercourse and downstream sedimentation caused by vehicles. Separate Operational Statements are available for *Ice Bridges and Snow Fills* used for temporary access during the winter and for non-temporary *Clear Span Bridges*.

The risks to fish and fish habitat associated with temporary stream crossings include the potential for direct harm to stream banks and beds, release of excessive sediments and other deleterious substances (e.g., fuel, oil leaks), loss of riparian habitat and disruption to sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your temporary stream crossing project without a DFO review when you meet the following conditions:

- the bridge is no greater than one lane in width, and no part of its structure is placed within the wetted portion of the stream,
- the work does not include realigning the watercourse,
- for fording in flowing waters and temporary bridges, the channel width at the crossing site is no greater than 5 metres from ordinary high water mark to ordinary high water mark (HWM) (see definition below),
- disturbance to riparian vegetation is minimized,
- the work does not involve dredging, infilling, grading or excavating the bed or bank of the watercourse,

- all crossing materials will be removed prior to the spring freshet, or immediately following project completion if this occurs earlier,
- fording involves a one time event (over and back) and will not occur in areas that are known fish spawning sites,
- the crossing will not result in erosion and sedimentation of the stream, or alteration (e.g., compaction or rutting) of the bed and bank substrates,
- the crossing does not involve installation of a temporary culvert, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out a Temporary Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*. For activities carried out under the *Crown Forest Sustainability Act*, the requirements of this Operational Statement are addressed through an existing agreement and the Ontario Ministry of Natural Resources is the first point of contact.

You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (SARA) (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Carrying Out a Temporary Stream Crossing

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Locate crossings at straight sections of the stream, perpendicular to the bank, whenever possible. Avoid crossing on meander bends, braided streams, alluvial fans, or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.
3. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the road or utility right-of-way. When practicable, prune or top the vegetation instead of uprooting.
4. Generally, there are no restrictions on timing for the construction of bridge structures or fording seasonally dry streambeds, as they do not involve in-water work. However, if there are any activities with the potential to disrupt sensitive fish life stages (e.g., fording of the watercourse by machinery) these should adhere to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
5. Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use.
 - 5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used, provided they do not constrict flows or block fish passage.
 - 5.2. Grading of the stream banks for the approaches should not occur.
 - 5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary bridge should be used in order to protect these areas.
 - 5.4. The one-time fording should adhere to fisheries timing windows (see Measure 4).
 - 5.5. Fording should occur under low flow conditions, and not when flows are elevated due to local rain events or seasonal flooding.
6. Install effective sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
7. For temporary bridges also employ the following measures:
 - 7.1. Use only clean materials (e.g., rock or coarse gravel fill, wood, or steel) for approaches to the bridge

- (i.e., not sand, clay or organic soil) and install in a manner that avoids erosion and sedimentation.
 - 7.2. Design temporary bridges to accommodate any expected high flows of the watercourse during the construction period.
 - 7.3. Restore the bank and substrate to pre-construction condition.
 - 7.4. Completely remove all materials used in the construction of the temporary bridge from the watercourse following the equipment crossing, and stabilize and re-vegetate the banks.
8. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.
 - 8.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
 - 8.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 8.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
 - 8.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering any watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with preferably native grass or shrubs.
10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) - The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the "active channel/bank-full level" which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

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